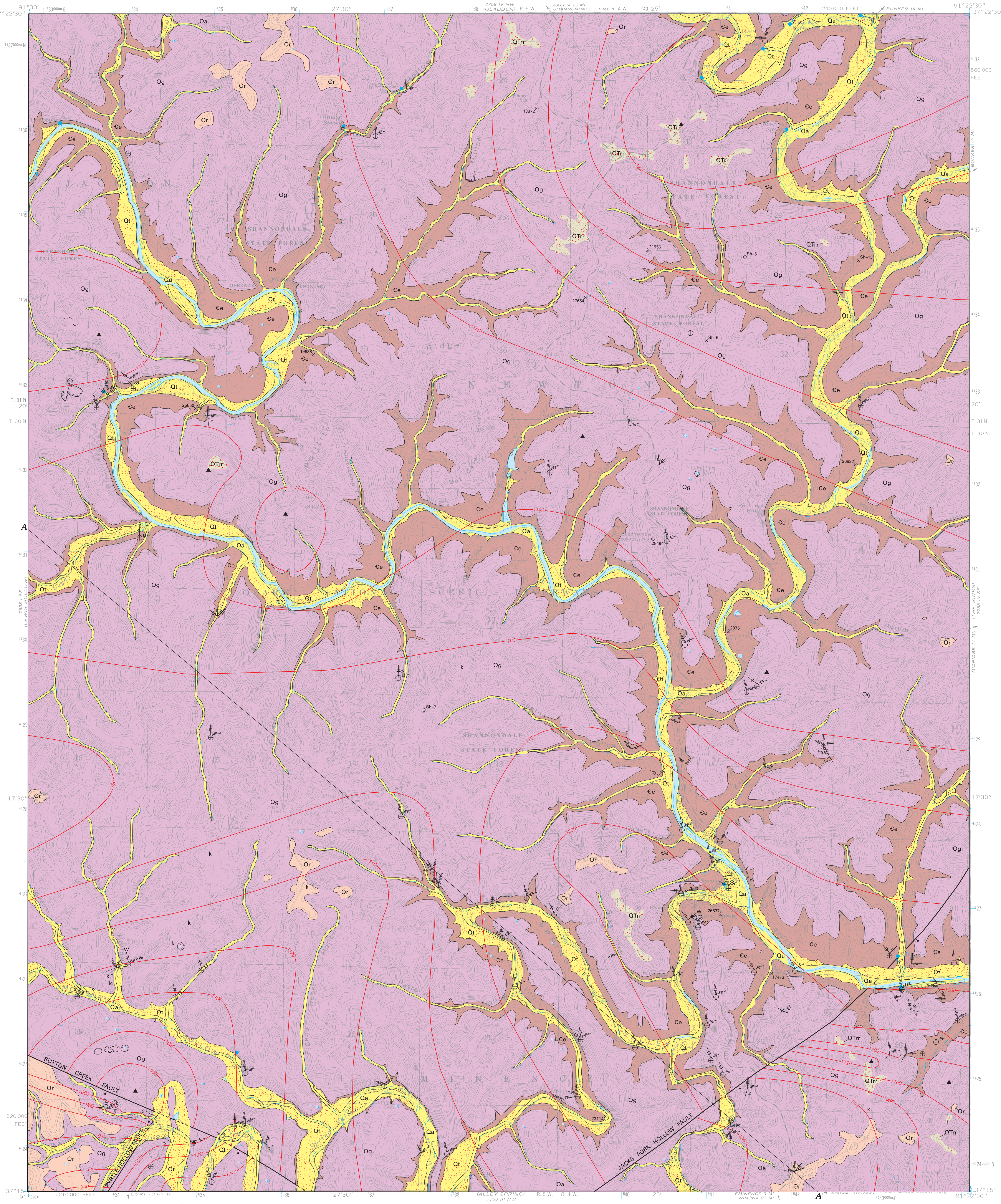


Base from U.S. Geological Survey, 1967
Photorevision as of 1985

Polyconic projection. 1927 North American datum, 10,000-foot grid based on Missouri coordinate system, east zone

1,000-meter Universal Transverse Mercator ticks, zone 15, shown in blue

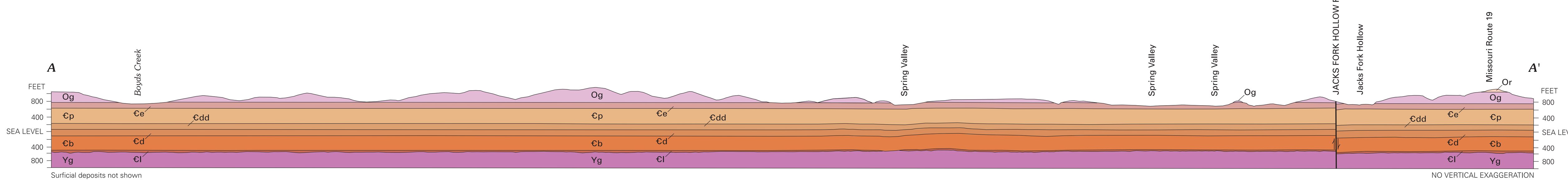
APPROXIMATE MEAN DECLINATION, 2009

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET

MAP LOCATION

Geology mapped in 2001 and 2002



CORRELATION OF MAP UNITS

Unit	Epoch	Period
Qa, Qt	Holocene and Pleistocene	QUATERNARY
QTrr		TERTIARY
Or, Og	Lower Ordovician	ORDOVICIAN
Ꞓe, Ꞓp, Ꞓdd, Ꞓd, Ꞓb, Ꞓl	Upper Cambrian	CAMBRIAN
Unconformity		
Yg		MESOPROTEROZOIC

In cross section only (Ꞓp, Ꞓdd, Ꞓd, Ꞓb, Ꞓl, Yg)

DESCRIPTION OF MAP UNITS

Qa **Alluvium (Holocene)**—Silt, sand, clay, and gravel derived from local bedrock. Gravel is angular to subrounded and consists mostly of chert and sandstone. Forms flood-plain and streambed deposits. Unit is as much as 30 ft thick along Current River

Qt **Terrace deposits (Pleistocene?)**—Silt, sand, clay, and gravel. Gravel mostly consists of rounded cobbles of chert and sandstone. Deposits occur within and along sides of stream valleys and lie as much as 30 ft above mapped alluvium (Qa). Unit is probably as much as 30 ft thick

QTrr **Residuum derived from Roubidoux Formation (Quaternary and Tertiary)**—Red and reddish-orange, sandy clay containing angular sandstone and chert cobbles and boulders as much as 4 ft in diameter. Sandstone cobbles and boulders, fine- to coarse-grained, poorly sorted, and contain symmetrical and asymmetrical ripple marks. Chert cobbles and boulders, light- to medium-gray consisting of banded, sandy, oolitic, and porcelaneous varieties. Occurs on hilltops and as colluvium on hillsides in areas where bedrock of the Roubidoux Formation has been deeply weathered and removed. Unit is as much as 40 ft thick

Or **Roubidoux Formation (Lower Ordovician)**—Sandstone, dolomite and chert. Sandstone, white to pale-orange, fine- to coarse-grained, thin- to thick-bedded, generally poorly sorted, commonly crossbedded and ripple-marked. Weathers light brown to reddish brown. Dolomite, light- to medium-gray, fine- to medium-grained, thin- to medium-bedded. Chert, white to medium-gray, locally sandy and oolitic. Occurs as thin beds, lenses, and nodules. Formation is highly weathered and not well exposed. Top of unit not present; thickness as much as 70 ft. Base of unit obscured by residuum; in adjoining quadrangles placed at base of lowest sandstone. Contact with underlying Gasconade Dolomite approximated by measuring upward 60 ft from top of *Cryptozoon*-bearing chert of Gasconade Dolomite

Og **Gasconade Dolomite (Lower Ordovician)**—Dolomite, chert, sandstone, and orthoquartzite. Formation is divided into an upper and middle unit and the Gunter Sandstone Member at base. Dolomite of middle unit, light- to very light gray, medium-bedded, medium- to coarse-grained; contains chert as nodules, stringers, and beds. Chert includes porcelaneous, oolitic, porous with druse, and stromatolitic varieties. Upper part of middle unit contains a persistent oolite bed. Dolomite of lower part of middle unit (Van Buren Formation of Bridge, 1930), light-gray to yellowish-gray, thin- to medium-bedded, fine- to medium-grained. Gunter Sandstone Member, light-gray to white sandstone, sandy dolomite, or orthoquartzite interbedded with light-gray to tan, fine-grained, thin-bedded dolomite. Thickness of the Gunter ranges from 10 to 20 ft. Thickness of Gasconade Dolomite exposed in quadrangle is about 300 ft. Contact with underlying Eminence Dolomite is placed at base of lowest sandstone or sandy dolomite of the Gunter Sandstone Member. Contact is locally unconformable

Ꞓe **Eminence Dolomite (Upper Cambrian)**—Dolomite and chert. Dolomite, light-gray, massive to thick-bedded, medium- to coarse-grained; weathers bluish gray or medium gray with a pitted surface; forms small knobs or pinnacles. Fresh surfaces contain oxidized, rust-colored mottles. Unit contains variable amounts of light-gray and white stringers and nodules of chert throughout; chert makes up less than 5 percent of formation. Thickness of unit is about 150 ft

Ꞓp **Potosi Dolomite (Upper Cambrian) (shown in cross section only)**—Dolomite and chert. Dolomite, light-brown, brown, and light-gray, massive to thick-bedded, fine- to medium-grained and contains quartz druse in vugs (locally extensive). Brown dolomite has fetid odor when freshly broken. Quartz druse developed as botryoidal masses of chalcedony with small quartz crystals coats surfaces. White to light-gray chert forms nodules and stringers. A 1- to 3-ft-thick bed of rusty, porous chert occurs near or at the contact with the overlying Eminence Dolomite. Unit is 300 ft thick in subsurface in southern part of quadrangle as shown in drill hole 21956; thickness averages about 400 ft in subsurface in nearby quadrangles

Ꞓdd **Derby-Doerun Dolomite (usage of Missouri Geological Survey, 2003) (Upper Cambrian) (shown in cross section only)**—Dolomite, siltstone, and shale. Dolomite, buff to light-gray, thin- to medium-bedded, fine- to medium-grained, argillaceous, and silty with minor amount of chert. Siltstone and shale, thin-bedded and interbedded with dolomite. Lower part of unit is silty and glauconitic. Thickness is 149 ft in drill hole 21956; thickness averages about 200 ft in subsurface of nearby quadrangles

Ꞓd **Davis Formation (Upper Cambrian) (shown in cross section only)**—Interbedded silty dolomite and green shale. Thickness is 202 ft in drill hole 21956; thickness averages 175 ft in subsurface of nearby quadrangles

Ꞓb **Bonneterre Formation (Upper Cambrian) (shown in cross section only)**—Interbedded dolomite, limestone, and siltstone. Dolomite, light-gray, medium-bedded, fine- to medium-grained, locally glauconitic and argillaceous; lower part locally contains small igneous rock fragments. Limestone, brownish-gray to pink, thin-bedded, fine-grained. Siltstone, light- to dark-gray, laminated, quartzose. Thickness is 299 ft in drill hole 21956; thickness averages 400 ft in subsurface of nearby quadrangles

Ꞓl **Lamotte Sandstone (Upper Cambrian) (shown in cross section only)**—Sandstone, light-gray to brown, quartzose, medium-grained, moderately to well-sorted. Thickness is generally a few feet, but can be highly variable. Unconformably overlies Middle Proterozoic volcanic rocks

Yg **Granite, undifferentiated (Mesoproterozoic) (shown in cross section only)**—Granite and biotite granite; encountered in drill holes Sh–5, Sh–6, Sh–7, and Sh–13 (Kisvarsanyi, 1975; Kisvarsanyi and Seeger, 1993)

EXPLANATION OF MAP SYMBOLS

Contact—Approximately located; dotted where concealed. Distribution and concentration of structural symbols indicate reliability of contact

Fault—Approximately located; dotted where concealed; bar and ball on downthrown side; arrows (in cross section) show relative direction of vertical movement. Only the vertical component of the offset was observed; however, similar faults exposed in mines in nearby quadrangles have strike-slip displacement

680 **Structure contour**—Drawn on base of Roubidoux Formation; projected where above land surface. Contour interval 20 ft

PLANAR FEATURES

Strike and dip of beds

5 Inclined

Horizontal

Strike and dip of joints—Point of observation at intersection of multiple symbols. Apertures are narrow (<0.5 in), except where noted by w (solutionally widened)

Throughgoing, vertical

Widely spaced (>6 ft)

Non-throughgoing, vertical

Widely spaced (>6 ft)

Moderately spaced (2–6 ft)

Closely spaced (<2 ft)

OTHER FEATURES

26637 **Drill hole**—Number refers to well records from Missouri Division of Geology and Land Survey; see table 1 for summary of well data

***Cryptozoon*-bearing chert bed of Gasconade Dolomite**—Locality where chert bed was observed in outcrop or highest float

Cataclastic deformation bands in sandstone float

Spring

Karst—Sinkholes larger than 30 ft diameter indicated by hachured lines, sinkholes less than 30 ft in diameter indicated by k

DISCUSSION

INTRODUCTION

The Round Spring 7.5-minute quadrangle is located in Shannon County, south-central Missouri on the Salem Plateau of the Ozark Plateaus physiographic province (Fenneman, 1938; Bretz, 1965; Imes and Emmett, 1994) (fig. 1). As much as 1,350 feet (ft) of flat-lying to gently dipping Upper Cambrian and Lower Ordovician rocks, mostly dolomite, overlie Mesoproterozoic intrusive rocks. The bedrock is overlain by unconsolidated residuum, colluvium, terrace deposits, and alluvium. Karst features, such as small sinkholes and caves, have formed in the carbonate rocks, and many streams are spring fed. The topography is a dissected karst plain with elevation ranging from 650 ft along the Current River on the eastern edge of the quadrangle to almost 1,200 ft at various places on the ridge tops. The area is mostly forested but contains some farmlands and includes sections of the Ozark National Scenic Riverways of the National Park Service along the Current River. Geologic mapping for this investigation began in the spring of 2001 and was completed in the spring of 2002.

STRATIGRAPHY

Upper Cambrian and Lower Ordovician dolomite, sandstone, and chert crop out in the Round Spring quadrangle. The Eminence Dolomite, Gasconade Dolomite, and Roubidoux Formation total more that 500 ft in thickness. Cambrian and Ordovician rocks overlie Mesoproterozoic rocks that are exposed in nearby quadrangles (Orndorff and others, 1999; McDowell and Harrison, 2000; Harrison and others, 2002).

Mesoproterozoic Rocks

Mesoproterozoic granitic rocks are not exposed in the Round Spring quadrangle. Mesoproterozoic granite recovered from a drill hole (Sh–13) in sec. 28, T. 31 N., R. 4 W. yielded a uranium-lead (U-Pb) age of 1,473±15 Ma (Bickford and others, 1981). These Mesoproterozoic rocks are a southwestern extension of the rocks that underlie the St. Francois Mountains of eastern Missouri; they are part of the Midcontinental Eastern Granite-Rhyolite terrane in the Midcontinent, U.S. (of Van Schmus and others (1993). Rubidium-strontium (Rb-Sr) and U-Pb ages of about 1,500 to 1,450 Ma (Bickford and Mose, 1975) and 1,350 Ma (Van Schmus and others, 1996) have been reported for the rocks of the St. Francois Mountains. Volcanic rocks have been divided into nine informal units by Orndorff and others (1999), McDowell and Harrison (2000), Orndorff and Harrison (2001), and Harrison and others (2002).

Paleozoic Rocks

The oldest exposed Paleozoic unit is the Eminence Dolomite of Late Cambrian age. The Eminence Dolomite was named by Ulrich (1911) for exposures near Eminence, Shannon County, Mo. The Eminence is a light-gray, medium- to coarse-grained, massive to thick-bedded cherty dolomite that typically weathers to pinnacles. About 150 ft of the Eminence Dolomite is exposed in the Round Spring quadrangle. The total thickness of the Eminence is about 300 ft in drill hole 21956 (table 1). The lower contact with the Potosi Dolomite is not exposed in the Round Spring quadrangle, but occurs in several drill holes (table 1).

Previous U.S. Geological Survey maps placed the Cambrian-Ordovician boundary in the upper part of the Eminence Dolomite (McDowell, 1998; Orndorff and others, 1999; McDowell and Harrison, 2000; Orndorff and Harrison, 2001; Harrison and others, 2002; Weems, 2002; Harrison and McDowell, 2003). Recent international agreement on redefinition of this boundary requires that it be placed at the contact between the Eminence and Gasconade Dolomites (Cooper and others, 2001). Bridge (1930) speculated that an important unconformity exists at the base of the Gasconade. Conodont biostratigraphy suggests that there may be multiple unconformities within the basal Gasconade (Repetski and others, 2000).

The Gasconade Dolomite was named by Nason (1892) for exposures along the Gasconade River in Laclede, Pulaski, and Phelps Counties, central Missouri. The basal 10 to 20 ft consists of interbedded sandstone, orthoquartzite, thin-bedded dolomite, and sandy dolomite. These rocks were named the Gunter Sandstone Member by Ball and Smith (1903) for exposures along the Niangua River at Gunter (now Hahatonka Springs), Camden County, central Missouri. Bridge (1930) used the name Van Buren Formation for the Gunter and the lower and middle parts of the middle unit of the Gasconade Dolomite (fig. 2). The Van Buren was defined by its faunal content and is no longer used. Pratt and others (1992) discussed a lower and upper part of the Gasconade Dolomite that is divided by a persistent *Cryptozoon*-bearing chert located about 60 ft below the top of the Gasconade. The middle unit of the Gasconade includes Bridge's Van Buren Formation and dolomite above the oolite bed to the *Cryptozoon*-bearing chert. The upper unit of the formation above the chert is thick-bedded dolomite. The thickness of the Gasconade in the Round Spring quadrangle is about 300 ft.

The Roubidoux Formation is the highest bedrock unit mapped in the quadrangle and consists of interbedded sandstone, dolomite, and chert. Nason (1892) named the Roubidoux and Heller (1954) designated an exposure along Roubidoux Creek in Texas County, Mo., as the type locality. In the Round Spring quadrangle, the unit crops out in only a few localities as it is obscured by thick residuum. The contact between the Gasconade and Roubidoux is approximately 60 ft above the *Cryptozoon*-bearing chert of the Gasconade Dolomite.

SURFICIAL GEOLOGY

Surficial deposits in the Round Spring quadrangle include residuum, colluvium, terrace deposits, and alluvium. Although most areas underlain by carbonate rocks contain residuum, only those areas on ridge tops that have a distinctive residuum that can be related to a now-removed, stratigraphically higher bedrock formation are included on this map. The residuum developed from leaching of dolomite by percolating waters containing carbonic acid. Carbonate minerals were dissolved, leaving poorly consolidated clay and sand containing fragments of chert, sandstone, and minor dolomite. The removal of carbonate materials also condensed the lithostratigraphic sequence. In many places, especially on ridge tops, the fragments included within the residuum indicate the parent formation. For example, residuum derived from the Roubidoux Formation (QTrr) contains large blocks and boulders of sandstone derived from that formation, but it lies on the Gasconade Dolomite. Fragments from these residual units also occur on hillsides as colluvium but are not mapped as a surficial unit. The age of the residuum was considered to be Cretaceous to Quaternary by Pratt and others (1992), who speculated that Cretaceous gravel occurs in parts of the Rolla 1° X 2° quadrangle.

Terrace deposits were mapped within the stream valleys and are similar in composition to alluvium. They were mapped as morphologic features along the sides of the stream valleys and at higher elevations than the present-day flood plain. In some areas, the 100-year flood plain may include areas mapped as terrace deposits.

KARST

Karst features in the Round Spring quadrangle include sinkholes, springs, caves, and disappearing and losing streams. Sinkholes mostly occur on ridge crests and plateau areas but also are found in stream valleys and on hill slopes. The majority of sinkholes are filled with sediment and residuum and formed by subsidence of the land surface. Catastrophic collapse has occurred as recently as 1999 near Summersville, Texas County, west of the Round Spring quadrangle.

This region of the Ozark Plateaus physiographic province is noted for its large and beautiful springs. The Current River, which flows through the Round Spring quadrangle, is fed by many of these large springs. Round Spring, located in the southeastern portion of the quadrangle, is a major attraction of the Ozark National Scenic Riverways. The average daily flow of Round Spring is about 26 million gallons (Vineyard and Feder, 1982). The morphology of the rise pool of the spring is a circular basin formed in the Eminence Dolomite by collapse of a cavern roof. A part of the cavern is preserved in the rock ledge and discharges the spring water to an outlet stream that feeds into the Current River.

Hundreds of caves have been identified in the Current River basin (Missouri Speleological Survey, 1977, 1982). Orndorff and others (2006) noted that 90 percent of caves in southeastern Missouri occur in dolomite just below sandstone horizons in the Gasconade Dolomite and Roubidoux Formation. In the Round Spring quadrangle, the majority of caves occur in the uppermost part of the Eminence Dolomite just below the Gunter Sandstone Member of the Gasconade Dolomite. Round Spring Cavern, an attraction of the Ozark National Scenic Riverways, is an excellent example of this relation. At several points in the cavern, the sandstone of the Gunter can be observed in the ceiling.

Losing and disappearing streams occur in many of the valleys that feed the Current River. Spring Valley Creek, a large stream in Spring Valley in the southern part of the quadrangle, has many stretches that lose stream flow to the subsurface; the stream disappears completely during low flow conditions. The aptly named Sinking Creek in the northeastern part of the quadrangle is another good example of a stream where surface runoff enters the subsurface through the streambeds. Other streambeds are virtually dry all year except during large precipitation events.

STRUCTURAL GEOLOGY

Faults

Faults within the Round Spring quadrangle were identified mainly by stratigraphic offset in the southern part of the quadrangle. All faults shown on the map appear as normal faults; however, kinematic indicators (mullion structures and en echelon fractures) as well as observation of faults in nearby mines located in the Viburnum Trend to the northeast indicate that there has been significant strike-slip motion.

The Sutton Creek fault extends from the Eminence quadrangle (Orndorff and others, 1999) northwest through the Alley Springs quadrangle, into the Round Spring quadrangle. The general trend of the fault is N. 65° W. The southwest side of the fault is downthrown. Evidence of this fault can be seen at Ink in the southwestern corner of the quadrangle where *Cryptozoon*-bearing chert of the upper part of the Gasconade is downfaulted to the southwest.

The northeast-trending Pyrtle Hollow fault extends northward from the Alley Spring quadrangle to the south and is cut by the Sutton Creek fault at Ink. The general trend of the fault is N. 35° E. with the northwest side downthrown as much as 100 ft.

In the southeast corner of the quadrangle, the Jacks Fork Hollow fault trends N. 50° E. and is downthrown to the southeast. The Gunter Sandstone Member of the Gasconade Dolomite was offset by about 30 ft by this fault in Jacks Fork Hollow with a gentle southeast dip of the downthrown block. East of Jacks Fork Hollow, the Roubidoux Formation is exposed along Missouri Route 19. The Jacks Fork Hollow fault extends into the Alley Spring quadrangle to the south where it is cut by the Sutton Creek fault. To the northeast, the Jacks Fork Hollow fault probably continues into The Sinks quadrangle; however, no apparent stratigraphic offset was observed in exposures along the Current River.

Joints

Joints were characterized by their orientation, spacing, persistence, and aperture. Generally, joints in the carbonate rocks are open and have narrow apertures; however, some joints have been widened by solution and are as much as 10 inches (in) wide. Most outcrops contain at least two joint sets.

Spacing refers to the mean perpendicular distance between parallel joints in a joint set. For descriptive purposes, widely spaced joints have greater than 6-ft spacing, medium-spaced joints have 2- to 6-ft spacing, and closely spaced joints have less than 2-ft spacing. Because the spacing of joints is related to the number of joints in an outcrop, weighting factors were applied in the statistical analyses of joints, including the generation of compass-rose diagrams (fig. 3). Closely spaced joints were weighted by a factor of 3, moderately spaced joints by a factor of 2, and widely spaced joints were used at unit value (weighting factors are included in figure 3).

Joint persistence refers to the degree to which joints have propagated through the rock. Two levels of persistence were defined for the map area, throughgoing and non-throughgoing. Throughgoing joints are those that cut the entire bedrock outcrop and persist through all beds. Non-throughgoing joints are those that are confined to individual beds and do not extend into adjacent strata. In the Round Spring quadrangle, less than 10 percent of joints are throughgoing.

Joints in the Cambrian and Ordovician rocks occur in two dominant sets: (1) those ranging from N. 10° W. to north-south and (2) those ranging from N. 70° E to N. 80° E. (fig. 3). The orientation of the joints are indicative of their development under regional stress fields. Cox (1995) interpreted similar oriented joints throughout the Ozarks as far-field deformation related to the Ouachita and Appalachian orogenies.

Table 1.—Summary of drill-hole data for the Round Spring quadrangle, Missouri.

[Drill-hole numbers are from Missouri Division of Geology and Land Survey. Numbers designated "Sh" are from Kisvarsanyi (1975). Og, Gasconade Dolomite; Ꞓe, Eminence Dolomite; Ꞓp, Potosi Dolomite; Ꞓdd, Derby-Doerun Dolomite; Ꞓd, Davis Formation; Ꞓb, Bonneterre Formation; Ꞓl, Lamotte Sandstone; Yg, Mesoproterozoic granite. Datum is mean sea level]

Drill-hole number	Location	Collar elevation, in feet	Contact elevation, in feet	Bottom elevation, in feet
Drill-hole data on file with Missouri Department of Natural Resources, Geological Survey and Resource Assessment Division				
2563	SE1/4,NE1/4 sec. 19, T. 30 N., R. 4 W.	707	No contacts; all Ꞓe	607
2875	W1/2, sec. 8, T. 30 N., R. 4 W.	700	620 Ꞓe–Ꞓp	576
13872	SE1/4,NE1/4 sec. 24 T. 31 N., R. 5 W.	1114	874 Og–Ꞓe	854
17473	SW1/4,SE1/4 sec. 20 T. 30 N., R. 4 W.	679	No contacts; all Ꞓe	619
19638	NW1/4,SW1/4 sec. 35 T. 31 N., R. 5 W.	798	No contacts; all Ꞓe	728
21956	centerline, S1/2 sec. 30 T. 31 N., R. 4 W.	1030	923 Og–Ꞓe 630 Ꞓe–Ꞓp 330 Ꞓp–Ꞓdd 181 Ꞓdd–Ꞓd -21 Ꞓd–Ꞓb -320 Ꞓb–Ꞓl	-350
23114	NE1/4,NW1/4 sec. 31 T. 30 N., R. 4. W.	755	520 Ꞓe–Ꞓp	255
25650	SE1/4,SW1/4 sec. 34 T. 31 N., R. 5 W.	760	520 Ꞓe–Ꞓp	450
26637	NW1/4,SW1/4 sec. 20 T. 30 N., R. 4 W.	745	565 Ꞓe–Ꞓp	345
26822	SW1/4,NW1/4 sec. 4 T. 30 N., R. 4 W.	734	519 Ꞓe–Ꞓp	414
27654	NW1/4,NW1/4 sec. 31 T. 31 N., R. 4 W.	1080	No data to 935; all Ꞓe	750
28494	SW1/4,SE1/4 sec. 6 T. 30 N., R. 4 W.	1125	850 Og–Ꞓe	705
Sh–5	SW1/4,SW1/4 sec. 29 T. 31 N., R. 4 W.	1050	No data to -555 all Yg	-576
Sh–6	SE1/4,NE1/4 sec. 31 T. 31 N., R. 4 W.	1020	No data to -549; all Yg	-558
Sh–7	NW1/4,NW1/4 sec. 13 T. 30 N., R. 5 W.	1090	No data to -387; all Yg	-394
Sh–13	SW1/4,SW1/4 sec. 28 T. 31 N., R. 4 W.	790	No data to -543; all Yg	-4214

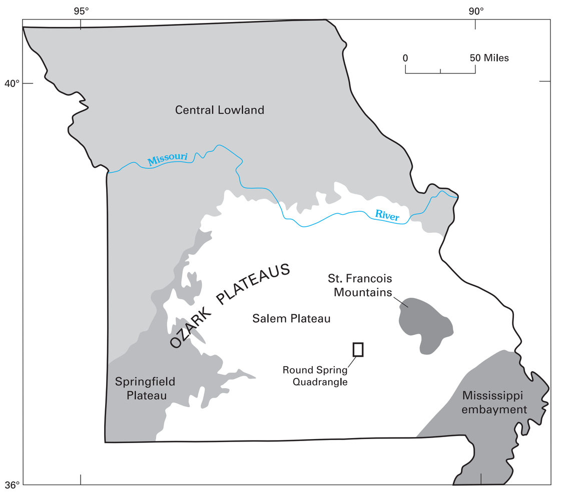


Figure 1.—Map showing location of the Round Spring 7.5-min quadrangle and the geomorphic subdivisions of Missouri. The St. Francois Mountains region is underlain mostly by Cambrian and Proterozoic rocks; the Salem Plateau by Cambrian and Ordovician rocks; the Springfield Plateau by Mississippian rocks; the Central Lowland province by Ordovician to Pennsylvanian rocks and Quaternary periglacial sediments; and the Mississippi embayment by Cretaceous to Quaternary sediments (adapted from Imes and Emmett, 1994).

REFERENCES CITED

Ball, S.H., and Smith, A.F., 1903, The geology of Miller County: Missouri Geological Survey, 2d Series, v. 1, 207 p.
Bickford, M.E., and Mose, D.G., 1975, Geochronology of Precambrian rocks in the St. Francois Mountains, southeastern Missouri: Geological Society of America Special Paper 165, 48 p.
Bickford, M.E., Harrower, K.L., Hoppe, W.J., Nelson, B.K., Nusbaum, R.L., and Thomas, J.J., 1981, Rb-Sr and U-Pb geochronology and distribution of rock types in the Precambrian basement of Missouri and Kansas: Geological Society of America Bulletin, v. 92, p. 323–341.
Bridge, Josiah, 1930, Geology of the Eminence and Cardareva quadrangles: Missouri Geological Survey [Report], 2d Series, v. 24, 228 p., 3 pls. in pocket, scale 1:62,500.
Cooper, R.A., Nowlan, G.S., and Williams, S.H., 2001, Global stratotype section and point for base of the Ordovician System: Episodes, v. 24, p. 19–31.
Cox, R.T., 1995, Intraplate deformation during the Appalachian-Ouachita orogeny as recorded by mesoscale structures on the Ozark plateau of North America: Columbia, Mo., University of Missouri, unpublished Ph.D. dissertation, 229 p.
Fenneman, N.M., 1938, Physiography of the eastern United States: New York, McGraw-Hill, 714 p.
Harrison, R.W., and McDowell, R.C., 2003, Geologic map of the Wilderness and Handy quadrangles, Oregon, Carter, and Ripley Counties, Missouri: U.S. Geological Survey Geologic Investigations Series Map I–2801, scale 1:24,000.
Harrison, R.W., Orndorff, R.C., and Weary, D.J., 2002, Geology of the Stegall Mountain 7.5-minute quadrangle, Shannon and Carter Counties, south-central Missouri: U.S. Geological Survey Geologic Investigations Series Map I–2767, scale 1:24,000.
Heller, R.L., 1954, Stratigraphy and paleontology of the Roubidoux Formation of Missouri: Missouri Division of Geology and Water Resources, 2d Series, v. 35, 118 p.
Imes, J.L., and Emmett, L.F., 1994, Geohydrology of the Ozark Plateaus aquifer system in parts of Missouri, Arkansas, Oklahoma, and Kansas: U.S. Geological Survey Professional Paper 1414–D, 127 p.
Kisvarsanyi, E.B., 1975, Data on Precambrian in drillholes of Missouri including rock type and surface configuration: Missouri Geological Survey Report of Investigations 56, 20 p.
Kisvarsanyi, E.B., and Seeger, C.M., 1993, List of basement drillsites in Missouri (Contribution to Precambrian Geology No. 22b): Missouri Geology and Land Survey Division Open-File Report OFR–93–92–GS, 38 p.
McDowell, R.C., 1998, Geologic map of the Greer quadrangle, Oregon County, Missouri: U.S. Geological Survey Geologic Investigations Series Map I–2618, scale 1:24,000.
McDowell, R.C., and Harrison, R.W., 2000, Geologic map of the Powder Mill Ferry quadrangle, Shannon and Reynolds Counties, Missouri: U.S. Geological Survey Geologic Investigations Series Map I–2722, scale 1:24,000.
Missouri Geological Survey, 2003, Geologic map of Missouri: Rolla, Mo., Missouri Division of Geology and Land Survey, scale 1:500,000.
Missouri Speleological Survey, 1977, Caves of Reynolds and Shannon Counties: Missouri Speleology, v. 17, nos. 1–2, 68 p.
Missouri Speleological Survey, 1982, Caves of the Current River Valley: Missouri Speleology, v. 22, nos. 3–4, 120 p.
Nason, F.L., 1892, A report on the iron ores of Missouri: Missouri Geological Survey [Report], 2d Series, v. 2, 366 p.
Orndorff, R.C., Harrison, R.W., and Weary, D.J., 1999, Geologic map of the Eminence quadrangle, Shannon County, Missouri: U.S. Geological Survey Geologic Investigations Series Map I–2653, scale 1:24,000.
Orndorff, R.C., and Harrison, R.W., 2001, Geologic map of the Winona quadrangle, Shannon County, Missouri: U.S. Geological Survey Geologic Investigations Series Map I–2749, scale 1:24,000.
Orndorff, R.C., Weary, D.J., and Harrison, R.W., 2006, The role of sandstone in the development of an Ozark karst system, south-central Missouri, *in* Harmon, R.S. and Wicks, C.M., eds., Perspectives on karst geomorphology, hydrology, and geochemistry; a tribute volume to Derek C. Ford and William B. White: Geological Society of America Special Paper 404, p. 31–38.
Pratt, W.P., Middendorf, M.A., Satterfield, I.R., and Gerdemann, P.E., 1992, Geologic map of the Rolla 1° X 2° quadrangle, Missouri: U.S. Geological Survey Miscellaneous Investigations Series Map I–1998, scale 1:250,000.
Repetski, J.E., Orndorff, R.C., and Weary, D.J., 2000, Conodont biostratigraphy of the Eminence Dolomite-Gasconade Dolomite contact interval in the Missouri Ozarks [abs.]: Geological Society of America Abstracts with Programs, v. 32, no. 3, p. A39–A40.
Ulrich, E.O., 1911, Revision of the Paleozoic system: Geological Society of America Bulletin, v. 22, p. 281–680.
Van Schmus, W.R., Bickford, M.E., Anderson, J.L., Bender, E.E., Anderson, R.R., Bauer, P.W., Robertson, J.M., Bowring, S.A., Condie, K.C., Denison, R.E., Gilbert, M.C., Grambling, J.A., Mawer, C.K., Shearer, C.K., Hinze, W.J., Karlsstrom, K.E., Kisvarsanyi, E.B., Lidiak, E.G., Reed, J.C., Jr., Sims, P.K., Tweto, Ogden, Silver, L.T., Treves, S.B., Williams, M.L., and Wooden, J.L., 1993, Transcontinental Proterozoic provinces, *in* Reed, J.C., Jr., Bickford, M.E., Houston, R.S., Link, P.K., Rankin, D.W., Sims, P.K., and Van Schmus, W.R., eds., Precambrian; Conterminous U.S., v. C–2 of The geology of North America: Boulder, Colo., Geological Society of America, p. 171–334.
Van Schmus, W.R., Bickford, M.E., and Turek, A., 1996, Proterozoic geology of the east-central Midcontinent basement, *in* van der Pluijm, B.A., and Catacosinos, P.A., eds., Basement and basins of eastern North America: Geological Society of America Special Paper 308, p. 7–32.
Vineyard, J.D., and Feder, G.L., 1982, Springs of Missouri: Missouri Division of Geology and Land Survey, Water Resources Report 29, 212 p.
Weems, R.E., 2002, Geologic map of the Low Wassie quadrangle, Oregon and Shannon Counties, Missouri: U.S. Geological Survey Geologic Investigations Series Map I–2719, scale 1:24,000.

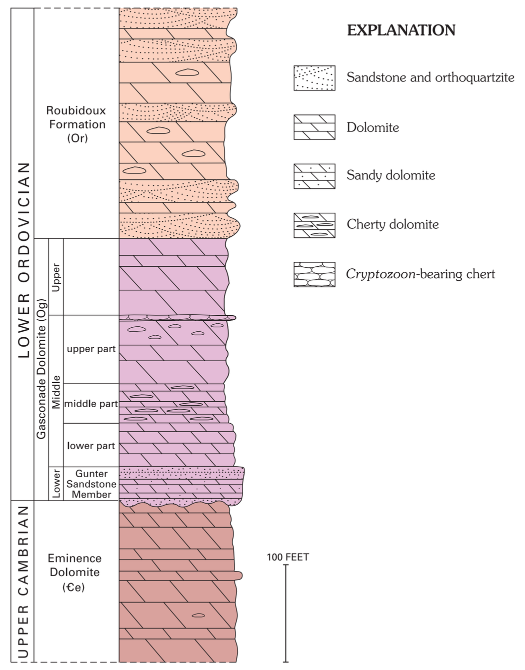


Figure 2.—Stratigraphic column of Paleozoic formations that crop out in the Round Spring quadrangle. Note the informal units of the Gasconade Dolomite.

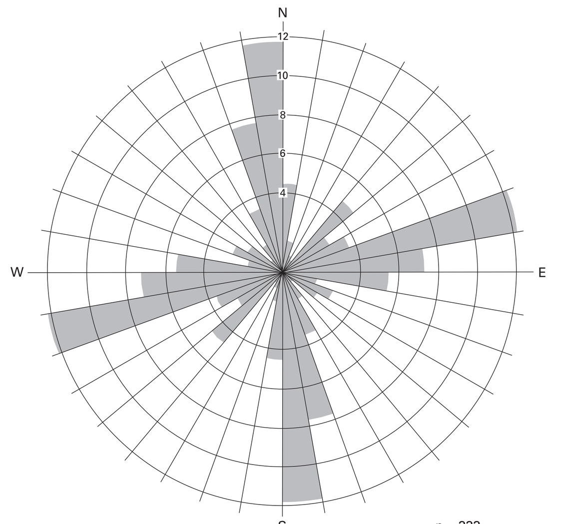


Figure 3.—Compass-rose diagram showing the dominant joint trends in the Paleozoic rocks of the Round Spring quadrangle. Joint sets were weighted by counting closely spaced joint sets three times, moderately spaced sets two times, and widely spaced sets one time. This system approximates the importance of each set relative to the volume of the rocks. Interval is 10 degrees. Numbers on diagram are percent of total. n, number of joints.

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By
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2009

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For sale by U.S. Geological Survey, Information Services, Box 25286, Federal Center, Denver, CO 80225, telephone 1-888-ASK-USGS

Printed on recycled paper

ISBN 978-1-4113-2437-4